What is claimed is:

1. A method for reducing solids buildup on an internal surface of ductwork between a reactor and subsequent product separation and recovery apparatus for conveying, at a first temperature, a gaseous product mixture containing materials which are otherwise deposited on the ductwork as tacky solids at said first temperature, comprising the step of introducing a barrier fluid at a second temperature, lower than the first temperature, along the internal surface of the ductwork to form a fluid barrier.

2. A method according to Claim 1, wherein the materials otherwise deposited as tacky solids include volatile metal chlorides.

3. A method according to Claim 2, wherein the volatile metal chlorides contain one or more chlorides selected from the group consisting of chlorides of Fe, Mn, Ni, Si, Al, Nb, Zr, V, Mg, and Ca.

4. A method according to Claim 1, wherein the chlorides include solid chlorides.

5. A method according to Claim 1, wherein the barrier fluid is a liquid at the second temperature.

6. A method according to Claim 1, wherein the barrier fluid is comprised of a material already present in the gaseous mixture.

7. A method for reducing chloride buildup on the internal surface of ductwork conveying, at a first temperature, a gaseous mixture containing such chlorides, comprising the step of introducing a barrier fluid at a second temperature, lower than the first temperature, along the internal surfaces of the ductwork to form a fluid barrier, wherein the barrier fluid is a liquid at the second temperature.

8. A method according to Claim 7, wherein the barrier fluid and second temperature are chosen so that the barrier fluid is vaporized in the ductwork.

9. A method according to Claim 7, wherein the barrier fluid is comprised of a material already present in the gaseous mixture.

10. A method for reducing chloride buildup on the internal surface of ductwork conveying, at a first temperature, a gaseous mixture containing volatile metal chlorides and titanium tetrachloride, comprising the step of introducing a barrier fluid at a second temperature, lower than the first temperature, along the internal surfaces of the ductwork to form a fluid barrier.

11. A method according to Claim 10, wherein the barrier fluid comprises nitrogen, carbon dioxide, or titanium tetrachloride.

12. A method according to Claim 10, wherein the barrier fluid is titanium tetrachloride.

13. A method according to Claim 10, wherein the barrier fluid is a liquid.

14. A method according to Claim 10, wherein the first temperature is from about 800 °C to about 1400 °C.

15. A method according to Claim 10, wherein the second temperature is from about 60 °F (15.6 °C) to about 100 °F (37.8 °C).

16. A method for reducing chloride buildup on the internal surface of ductwork conveying, at a first temperature, a gaseous mixture containing volatile metal chlorides and titanium tetrachloride, comprising the step of spraying liquid titanium tetrachloride at a second temperature, lower than the first temperature, along the internal surface of the ductwork to form a fluid barrier.

17. A method according to Claim 16, wherein the first temperature is from about 800 °C to about 1400 °C.

18. A method according to Claim 16, wherein the second temperature is from about 60 °F (15.6 °C) to about 100 °F (37.8 °C).

19. A process for producing titanium tetrachloride, comprising the steps of:

producing a gaseous mixture containing titanium tetrachloride and volatile metal chlorides at a first temperature;

conveying the gaseous mixture through ductwork having an internal surface;

introducing fluid along the internal surface of the ductwork at a second

temperature, lower than the first temperature;

separating out solids from the gaseous mixture; and

recycling some portion or component of the separated gaseous mixture to be used as the introduced fluid in the introducing step.

20. A process according to Claim 19, wherein the introduced fluid comprises titanium tetrachloride.

21. A process according to Claim 19, wherein the produced gaseous mixture is at a temperature of from about 800 °C to about 1400 °C.

22. A process according to Claim 19, wherein spraying step is at a temperature of from about 60 °F (15.6 °C) to about 100 °F (37.8 °C).

23. A spray device comprising:

a means for attaching the spray device to ductwork;

an inlet capable of receiving fluid from a fluid supply external to the ductwork;

a nozzle capable of spraying fluid along the inside surface of the ductwork; and

a conduit connecting the inlet to the nozzle, providing for communication of fluid from the inlet to the nozzle.

24. A spray device according to Claim 23, wherein the means for attaching comprises a flange.

25. A spray device according to Claim 23, wherein the nozzle is capable of spraying fluid in a spray pattern sufficient to cover the inner surface of the ductwork in the vicinity of the nozzle.